

CLAIM AMENDMENTS

The current claim status is:

Claim 1. (currently amended) A system for batch processing a plurality of different combinatorial catalyst materials for evaluation comprising:

a physical vapor deposition apparatus including a sealable chamber having an access means, the chamber including a plurality of separately controllable plasma sources radially disposed about a central location within the chamber such that the plasma directed from the sources may be focused upon the central location and a substrate disposed upon a shaft vertically positioned at the central location of the chamber around which shaft the substrate may axially rotate, the substrate having a plurality of ~~discrete-separated-areas~~spots thereon to which the plasma may be directed, each of the plurality of separately controllable plasma sources comprising a cluster of plasma guns oriented with respect to the central location such that each gun in the cluster may be simultaneously focused upon a certain discrete ~~area-spot~~ in the central location wherein the deposition of plasma of a predetermined type and in a predetermined amount upon each ~~selected-areas~~spot of the substrate by each plasma gun is controlled;

the substrate being controllably positionable within the chamber such that a first ~~selected area-spot~~ upon the substrate may be positioned in accordance with a selection from a matrix of z, x and y coordinates that define the location of the ~~selected-areas~~spot, wherein, z defines axial rotation coordinates that align the ~~selected-areas~~spot on the substrate with one of the plasma gun clusters, x defines vertical coordinates that align the same ~~area-spot~~ with the same one of the plasma gun clusters and y defines horizontal coordinates that align the same ~~area-spot~~ with the same one of the plasma gun clusters, each such alignment occurring when the plasma gun clusters are sequentially focused upon each ~~selected-areas~~spot as the substrate rotates to a fixed radial position around the central axis;

means for controlling the plasma deposition on each ~~selected-area~~spot from each source when the plasma source and the substrate are in alignment such that each ~~selected area~~spot may be sequentially aligned with respect to each ~~plasma-source~~cluster according to predetermined parameters that determine the exposure of the ~~area~~spot to each of the controllable plasma sources.

Claim 2. (currently amended) The system of claim 1 in which the means for controlling the plasma sources comprises programmable parameters determining, for a specified flux of plasma power and time, the characteristics of the material deposited by the plasma source upon ~~the selected-area~~each spot of the substrate.

Claim 3. (cancelled)

Claim 4. (cancelled)

Claim 5. (cancelled)

Claim 6. (currently amended) The system of claim 1 in which the substrate includes multiple separately defined circular ~~area~~spots and is centrally positioned within the chamber, the substrate being moveable with respect to a program controlled x-y table such that each separately defined spot~~area~~ upon the surface of the substrate may be positioned by control means for the x-y table in-alignment with the focus of a plasma source.

Claim 7. (cancelled)

Claim 8. (currently amended) The system of claim 6 in which the multiple separately defined selected areas-spots of the substrate comprise a plurality of separately defined areas spots arranged a matrix defined by columns and rows.

Claim 9. (currently amended) The system of claim 8 in which the relationship of the number (N) of separately defined areas-spots in the rows to the number of separately defined areas-spots (N) in the columns is $rows_N = columns_N$.

Claim 10. (currently amended) The system of claim 8 in which the relationship of the number (N) of separately defined areas-spots in one column to the number of separately defined areas-spots in an adjacent column is areas-spots in $column_N = N$ and areas-spots in adjacent $column_{N+1} = N+1$.

Claim 11. (currently amended) The system of claim 8 in which the relationship of the number of separately defined areas-spots in one row to the number of separately defined areas spots in an adjacent row is : areas-spots in $row_N = N$ and areas-spots in adjacent $row_{N+1} = N+1$.

Claim 12. (currently amended) The system of claim 1 in which the plasma sources are controlled such that the materials originating from the sources are deposited upon each spot an area of the substrate in either of 1) a sequential layer deposition and 2) a co-deposition.

Claim 13. (currently amended) The system of claim 8 wherein the substrate comprises a side surface of a block positioned within the central location of the chamber, the block having a multiplicity of cylindrical substrate elements extending from the side surface thereof, each cylindrical substrate element individually defining a selected areaspot, the cylindrical substrate elements maintained in an array of cylindrical columns and cylindrical rows formed within the

block, in which the upper surfaces of the cylindrical substrate elements comprise the discrete areas-spots exposed to the sources.

Claim 14. (previously presented) The system of claim 13 in which the cylindrical substrate elements are inset within the block in a matrix and a plate having a matrix of openings concentric with the matrix of elements in the block is applied facing the surface of the block, such that the openings in the plate are aligned with the elements and the cross-section area of an opening in the plate is less than the cross-section area of the surface of the corresponding concentric cylindrical element.

Claim 15. (currently amended) The system of claim 6 in which the means for controlling the sources of different ions includes programmed means for selecting one or more than one of at least: 1) a plasma source within a cluster; 2) the power and the duration of operation of the source; and 3) the position of the substrate such that aeach selected area-spot of the substrate is exposed to the plasma source for the duration of operation determined.

Claim 16. (currently amended) The system of claim 15 in which the means for selecting a plasma source and the means for controlling the power and the duration of operation of the source includes means for controlling the sources in essentially the same operation such that plasma materials from the sources are co-deposited with respect to an-areaeach spot on the surface of the substrate.

Claim 17. (currently amended) The system of claim 15 in which the means for selecting a plasma source and the means for controlling the power and the duration of operation of the source includes means for controlling the sources in essentially the same operation such that

plasma materials from the sources are deposited as layers with respect to ~~an area~~each spot on the surface of the substrate.

Claim 18. (currently amended) The system of claim 13 in which the means for controlling the sources of different ions includes programmed means for selecting one or more than one of at least: 1) a plasma source within a cluster; 2) the power and the duration of operation of the source; and 3) the position of the substrate such that ~~a selected area~~each spot of the substrate is exposed to the plasma source for the duration of operation determined.

Claim 19. (currently amended) The system of claim 18 in which the means for selecting a plasma source and the means for controlling the power and the duration of operation of the source includes means for controlling the sources in essentially the same operation such that plasma materials from the sources are co-deposited with respect to ~~an area~~each spot on the surface of the substrate.

Claim 20. (currently amended) The system of claim 18 in which the means for selecting a plasma source and the means for controlling the power and the duration of operation of the source includes means for controlling the sources in essentially the same operation such that plasma materials from the sources are deposited as layers with respect to ~~an area~~each spot on the surface of the substrate.